

12153RRUS01U

**CLAIMS:**

**What is claimed is:**

1 1. A system for transmitting data over a wireless  
2 channel said system comprising:

3 a Trellis coder that specifically encodes said data  
4 to substantially eliminate fading on a transmission  
5 channel and increase capacity on an allocated bandwidth;  
6 and

7 a wireless transmitter that transmits said encoded  
8 data over said wireless channel.

1 2. The system of Claim 1, further comprising a  
2 quadrature amplitude modulator that modulates said encoded  
3 data to increase a number of simultaneous transmissions  
4 within said allocated bandwidth.

1 3. The system of Claim 1, further comprising a digital  
2 converter that converts said data into radio waves to  
3 enable wireless transmission.

1 4. The system of Claim 3, wherein said Trellis coder  
2 includes a Trellis decoder and decodes encoded data  
3 received from a next system across said wireless channel.

1 5. The system of Claim 3, wherein said Trellis coder is  
2 a Trellis encoder, said system further comprising a  
3 Trellis decoder that decodes encoded data received from a  
4 next system across said wireless channel.

1        6. The system of Claim 3, wherein said Trellis coder is  
2        located on an integrated circuit within a wireless  
3        component.

5        8. The system of Claim 1, wherein said Trellis coder  
6        provides a maximum Euclidean distance between words of  
7        said data during encoding to substantially reduce signal  
8        power required for said wireless transmission.

12153RRUS01U

1 9. A GPRS/EDGE network for wireless transmission  
2 comprising:

3  
4 a data transmission station and a data receiving  
5 station;

6 wherein said data transmission station including a  
7 wireless transmitter and said data receiving station  
8 including a wireless receiver;

9 wherein said data transmission station comprises a  
10 Trellis encoder that specifically encodes data being  
11 transmitted to substantially eliminate fading on a  
12 transmission channel between said data transmission and  
13 data receiving stations, reduces signal power required  
14 for transmission of said data, and increase capacity on  
15 an allocated bandwidth.

1 10. The GPRS/EDGE network of Claim 9, wherein said data  
2 receiving station comprises a Trellis decoder that  
3 decodes said encoded data.

1 11. The GPRS/EDGE network of Claim 10, wherein said data  
2 transmission station comprises a quadrature amplitude  
3 modulator that modulates said encoded data to increase a  
4 number of simultaneous transmissions within said  
5 allocated bandwidth.

1 12. The GPRS/EDGE network of Claim 9, wherein said data  
2 transmission station is a mobile station.

1 13. The GPRS/EDGE network of Claim 12, wherein said  
2 Trellis encoder is located on an integrated circuit  
3 within said mobile station.

00521 03/02/00

12153RRUS01U

1 14. The GPRS/EDGE network of Claim 13, wherein said data  
2 is voice data.

1 15. A method for implementing Trellis coding within a  
2 wireless network, said method comprising:

3 receiving data for transmission over a wireless link  
4 of said wireless network;

5 evaluating a maximum Euclidian distance between code  
6 words of said data to reduce signal power requirements;

7 minimizing fading channel considerations among said  
8 code words;

9 encoding said data utilizing results of said  
10 evaluating and minimizing steps; and

11 transmitting said encoded data over said wireless  
12 link.

1 16. The method of Claim 15, further comprising the step  
2 of modulating said encoded data utilizing quadrature  
3 amplitude modulation that increases a number of  
4 simultaneous transmissions within an available bandwidth.

1 17. The method of Claim 15, further comprising the  
2 step of decoding said Trellis encoded data received via  
3 said wireless air link.

12153RRUS01U

4 18. A computer program product comprising:

5 a computer readable medium; and

6 program instructions on said computer readable  
7 medium for:

8 receiving data for transmission over a wireless  
9 link of said wireless network;

10 evaluating a maximum Euclidian distance between  
11 code words of said data to reduce signal power  
12 requirements;

13 minimizing fading channel considerations among  
14 said code words;

15 encoding said data utilizing results of said  
16 evaluating and minimizing steps; and

17 transmitting said encoded data over said wireless  
18 link.

1 19. The computer program product of Claim 18, further  
2 comprising program instructions for modulating said  
3 encoded data utilizing quadrature amplitude modulation  
4 that increases a number of simultaneous transmissions  
5 within an available bandwidth.

20. A method of data transmission over a wireless air link in GPRS/EDGE, said method comprising the steps of:

decoding radio wave signals received from said wireless air link via a Trellis decoder wherein channel fading due to said wireless air link is substantially reduced.

22. The method of Claim 21, wherein said encoding step includes the step of maximizing an Euclidean distance between neighboring words of said data to reduce signal power required for transmission of said data.

23. The method of Claim 22, wherein said Trellis coding utilizes Amplitude Phase Modulation to form constellation lattices in a signaling space.